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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/517,769

12/27/2004

Douglas John Thomson

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6616

1059

7590

05/16/2006

BERESKIN AND PARR
40 KING STREET WEST
BOX 401
TORONTO, ON M5H 3Y2
CANADA

EXAMINER

DAVIS, OCTAVIA L

ART UNIT

PAPER NUMBER

2855

DATE MAILED: 05/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/517,769

Applicant(s)

THOMSON ET AL.

Examiner

Octavia Davis

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-35 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>10/26/05</u> | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Specification

1. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors because it contains more than 20 pages. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1 – 6, 9 – 22, 25, 26 and 28 – 35 are rejected under 35 U.S.C. 102(b) as being anticipated by Gershenfeld et al (6,025,725).

Regarding claims 1, 17 and 25, Gershenfeld et al disclose electrically active resonant structures for wireless monitoring and control comprising a body having an electromagnetic resonator package 100 adapted to produce a response signal responsive to an interrogation signal, the body being coupled to the structure (See Col. 4, lines 8 – 23), a coupling means (See Col. 4, lines 16 – 23) coupled to the body that transfers the interrogation signal to electromagnetic resonator and transfer the response signal out of the resonator and an interrogator 50 generating and transmitting the interrogation signal (See Col. 4, lines 16 – 20).

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Regarding claims 2 – 6 and 18 - 22, the resonator is of a dielectric material 10 (See Col. 5, lines 23 – 25) that is composed of sheets 10, 22, 24 which include perforations to expose the dielectric material to the environment (See Col. 6, lines 8 – 21 and Col. 7, lines 11 – 13, See Fig. 1A).

Regarding claim 9, the interrogator 50 includes an antenna and a signal generator (not shown) (See Col. 4, lines 12 – 16 and 20 – 24 and Col. 5, lines 6 – 21).

Regarding claim 10, a sensing means is coupled to the antenna (See Col. 2, lines 31 – 38, Col. 6, lines 55 – 63 and Col. 8, lines 8 - 23).

Regarding claim 11, an input, output and control means (See Col. 4, lines 40 - 47) is connected to the antenna.

Regarding claims 12 – 16 and 28 – 35, the resonator's harmonic spectra is characterized and the harmonic spectrum for a particular excitation frequency is obtained by applying a continuous signal at that frequency through transmitting interrogator 50 and sensing amplitude over a band of frequencies at the receiving coil 502, the receiver sweeping through a range of frequencies greater than and less than that of the applied signal to characterize the harmonic spectrum for the applied signal frequency (See Col. 2, lines 32 – 47 and Col. 5, lines 1 – 22).

Regarding claim 26, the external condition or strain of the structure is sensed and the response signal is processed to determine the strain (See Col. 2, lines 31 – 33 and Col. 8, lines 8 – 32).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the

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subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 7, 8, 23, 24 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gershenfeld et al in view of Spillman, Jr. (5,440,300).

Regarding claims 7, 8, 23, 24 and 27, Gershenfeld et al disclose all of the limitations of these claims except for a mechanical amplifier coupled to the electromagnetic cavity, the mechanical amplifier including a first member having a first region with a first length and a second member having a second region with a second length, the second region being coupled to the first region, the first region being exposed to the strain and the second region being coupled to the cavity. However, Spillman, Jr. discloses smart structures having embedded sensors and actuators comprising sensors 14 for detecting strain in a body A (See Col. 2, lines 33 – 39), data collection and processing electronics 12 connected to an electromagnetic antenna 22 that provides transmission of data collected and processed by the electronics (See Col. 2, lines 59 – 68 and Col. 3, lines 1 – 2), the processing electronics 12 being amplitude or frequency modulated (See Col. 3, lines 4 – 8) and panels C, D, E, F forming smart structures that include the processing electronics and that are powered and interrogated by a network of interrogation units 31 – 34 (See Col. 3, lines 59 – 65).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Gershenfeld et al according to the teachings of Spillman, Jr. for the purpose of, sensing, processing and obtaining physical data from a structure (See Spillman Jr. Col. 1, lines 32 - 37).

Conclusion

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6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Herlik (6,354,152) discloses a method and system to measure dynamic loads or stresses in aircrafts, machines and structures.

Watters et al (7,034,660) disclose sensor devices for structural health monitoring.

Phillips (4,897,541) discloses sensors for detecting electromagnetic parameters utilizing resonating elements.

Grimes (6,359,444) discloses a remote resonant circuit analyte sensing apparatus with a sensing structure and associated method of sensing.

Kuhn (4,196,398) discloses regulation of a plurality of superconducting resonators.

Belk et al (5,969,260) disclose a remotely interrogatable apparatus and method for detecting defects in structural members.

Wilk (6,980,688) discloses a method and apparatus for investigating the integrity of structural members.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Octavia Davis whose telephone number is 571-272-2176. The examiner can normally be reached on Mon through Thurs from 9 to 6. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz, can be reached on 571-272-2180. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications

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may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



OD/2855

5/8/06



MAX NOORI
PRIMARY EXAMINER